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PLANTAE COLOMBIANAE XI
DE PLANTIS PRINCIPALITER COLOMBIAE VALLIS AMAZONICAE OBSERVATIONES

BY
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STUDY of recently made collections of plants, chiefly from the Amazon watershed of Colombia, has brought to light a number of data which contribute to our knowledge of the flora of the northwesternmost reaches of the Amazon system. A few of the collections represent concepts which apparently have not hitherto been described. Others are noteworthy, since they alter or increase our understanding of plant distribution.

I have to thank Dr. Lyman B. Smith for determining the Cyperaceae and Bromeliaceae; Mr. Charles Schweinfurth, who identified the orchids; and Dr. Robert C. Foster for his attention to tiliaceous and lythraceous species.

CYPERACEAE

Cephalocarpus Dracaenula *Nees* in Martius Fl. Bras. 2, pt. 1 (1842) t. 18.

Cephalocarpus Dracaenula, a sedge which superficially resembles a Navia, was collected in La Pedrera (Cupatí) by Martius in 1820. It was collected the second time

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nearly a century later at the same locality by Ducke who reported (in La Géogr. 30 (1914–15) 365–372) that among the strange plants on the rocks at the summit of the Cerro de La Pedrera "on remarque. . . . une très curieuse Cypéracée inconnue ailleurs, le *Cephalocarpus Dracaenula* Nees."

Colombia: Intendencia del Amazonas, Río Caquetá, La Pedrera. April 1944, *Richard Evans Schultes 5858*.

Bromeliaceae

Aechmea corymbosa (*Mart.*) *Mez* in Martius Fl. Bras. 3, pt. 3 (1892) 316.

The type of this species was collected by Martius on the Río Caquetá of Colombia near the Brazilian boundary. *Schultes 5377* greatly extends to the northwest the known range of this species.

Colombia: Comisaría del Vaupés, forest between Apaporis and Vaupés Rivers, path from Puerto Naré to Victoria. Alt. about 300 m. "Epiphyte. Flowers white. Bracts scarlet. Very fragrant." April 10–17, 1943, *Richard Evans Schultes 5377*.

Aechmea Schultesiana (*Mart.*) *Mez* in Martius Fl. Bras. 3, pt. 3 (1892) 334.

In 1942, Smith indicated (in Caldasia no. 1 (1942) 13) that *Cuatrecasas 7250* from Mitú in the Comisaría del Vaupés was the first collection of *Aechmea Schultesiana* from Colombia.

Since that date, three additional collections from very far distant points in Colombia have been made, indicating that the species is to be found in nearly all sectors of the Republic.

Aechmea Schultesiana is known from Colombia, Peru, Venezuela and Costa Rica. *Schultes 3610* was collected on the Colombian-Ecuadorean border, so the species must be also assigned to Ecuador.

Colombia: Comisaría del Putumayo, Río Sucumbíos, Santa Rosa y alrededores. Alt. 380 m.? "Bracts red. Epiphyte." April 7–8, 1942,

Richard Evans Schultes 3610.—Departamento de Antioquia, selva veranera siempreverde cerca de Porcesito en el valle del río Medellín, alt. aprox. 1100 m., April 16, 1946, *W. H. Hodge 6793.*—Departamento del Norte de Santander, Bellavista on Pipeline. September 15, 1946, *M. B. & R. Foster 1696.*

Aechmea tillandsioides (*Mart.*) *Baker* var. **Kienastii** (*E. Morr ex Mez*) *L. B. Smith* in Caldasia no. 5 (1942) 5.

This variety is known from many parts of Colombia and from Venezuela. Two collections from the Amazon watershed have been cited by Smith (loc. cit.): *Pérez-Arbeláez & Cuatrecasas 6758* from Mitú, and *Cuatrecasas 8832* from Florencia. *Schultes 5413* extends the species to the vast drainage-area of the Apaporis River.

Colombia: Comisaría del Vaupés, Macaya-Ajaju River confluence. Mount Chiribiquete. May 15–16, 1943. *Richard Evans Schultes 5413.* —Comisaría del Vaupés, Río Macaya, vicinity of Cachivera del Diablo. "Bracts red, fruits white." May 14, 1943, *Richard Evans Schultes 5440.*

Navia caulescens *Martius ex Schultes fil.* Syst. 7 (1830) 1195.

The type of this very restricted endemic was collected by Martius at Araracuara and on the mountain at Cupatí (La Pedrera) on the Río Caquetá. It was collected again near the top of the Cerro de La Pedrera by Ducke in 1912.

In a summary of plants collected on this trip at La Pedrera, Ducke (loc. cit. 365–372) stated of this bromeliad: "Sur les grands blocs de pièrre abonde une Broméliacée très curieuse, la *Navia caulescens* Mart., découverte ici en 1820 et qui n'avait jamais été ensuite retrouvée." *Schultes 5859*, also from the top of the mountain at La Pedrera, represents the fourth collection of this strikingly distinct endemic.

Colombia: Intendencia del Amazonas, Río Caquetá, La Pedrera. April 1944, *Richard Evans Schultes 5899.*

Burmanniaceae

Dictyostega orobanchioides (*Hook.*) *Miers* var. **parviflora** (*Benth.*) *Jonker ex Pulle* in Kon. Ver. Kolon. Inst. Amsterdam Med. 30 (1938) 185.

This interesting saprophytic plant is widespread, and is known from Trinidad, Amazonian Brazil, Venezuela, British Guiana, Surinam and Colombia. *Schultes 5672* is the third collection from Colombia and the second from Colombia's Amazon drainage-area. Jonker cites a collection from Sur de Santander; *Cuatrecasas 7177* from Cerro de Circasia on the Río Vaupés above Mitú is also referable to this variety.

Colombia: Comisaría del Caquetá, Cerro del Castillo, Río Apaporis, alt. 350–1000 ft. July 27, 1943, *Richard Evans Schultes 5672*.

Orchidaceae

Epidendrum imatophyllum *Lindley* Gen. et Sp. Orch. Pl. (1831) 106.

Epidendrum imatophyllum is a very common tropical American orchid. It has apparently been collected twice in Colombia: *Haught 1419* from Santander and *Schultes 6729*, the first from the Colombian Amazonia.

Colombia: Intendencia del Amazonas, Río Loretoyacu. "Flowers purple." October 20–30, 1945, *Richard Evans Schultes 6729*.

Epidendrum nocturnum *Jacquin* var. **minus** *Cogniaux* in Bull. Soc. Roy. Bot. Belg. 43 (1907) 323.

Epidendrum nocturnum var. *minus* was described from material collected by Ule in Loreto, Peru. It is exceedingly common in the adjacent Amazonian areas of Colombia.

Colombia: Intendencia del Amazonas, Río Karaparaná, entre las bocas y El Encanto. "Epiphyte. Flowers cream-yellow. Lip white. Fragrant." May 22–28, 1942, *Richard Evans Schultes 3845*.

Habenaria monorrhiza (*Sw.*) *Reichenbach fil.* in Ber. Deutsch. Bot. Gesell. 3 (1885) 274.

Known from Peru (where it is very common), Ecuador, Venezuela and Puerto Rico, this beautiful Habenaria has apparently hitherto been collected but twice in Colombia: *Klug 1662* from Umbría in the Putumayo (only a few miles from the locality of *Schultes & Smith 3005*) and *Lawrance 206* from Mt. Chapón in Boyacá, the former from an altitude of 325 meters, the latter from 1036 meters.

COLOMBIA: Comisaría del Putumayo, Mocoa y alrededores al norte, alt. 750–850 m. "Flowers white. Growing in sand on bank." December 3–7, 1942, *Richard Evans Schultes & C. Earle Smith 3005.*

Maxillaria rufescens *Lindley* in Bot. Reg. (1836) t. 1848.

A widespread species, *Maxillaria rufescens* has apparently not been collected previously from Colombia. Known from Trinidad, Honduras, Guatemala, British Honduras, Nicaragua, Costa Rica and Cuba, it is apparently very common in Central America and the Antilles. It is known also from Brazil, but collections are rare.

COLOMBIA: Intendencia del Amazonas, Río Putumayo, carretera entre Caucaya y La Tagua. "Epiphyte." May 17, 1942, *Richard Evans Schultes 3791.*

Odontoglossum coronarium *Lindley* Fol. Orch. Odontog. (1852–59) 21.

Odontoglossum coronarium has hitherto been known from Panama, Colombia, Peru, and, probably, Ecuador.

COLOMBIA: Comisaría del Putumayo, Valle de Sibundoy, Porotoyaco, alt. about 2250 m. "Sepals and petals red-brown, yellow in spots. Lip yellow; lower half of lip red-brown. Column red-brown and yellow." December 16, 1942, *Richard Evans Schultes & C. Earle Smith 3150.*

Sobralia rosea *Poeppig & Endlicher* Nov. Gen. ac Sp. 1 (1836) 54, t. 93.

Schultes 3559 is the second collection from southern Colombia of this orchid which is widespread on the eastern slopes of the Andes.

COLOMBIA: Comisaría del Putumayo, Río San Miguel ó Sucumbíos, Santa Rosa y alrededores. "Flowers white, tip of column purple. Kofán Indian name: *ku-pu-ñú-mem-ba*. April 7–8, 1942, *Richard Evans Schultes 3559*.

Xylobium squalens (*Lindl.*) *Lindley* var. **gracile** (*Schltr.*) *C. Schweinfurth* in Bot. Mus. Leafl. Harvard Univ. 11 (1944) 198.

This is apparently the first collection from Colombia of *Xylobium squalens* var. *gracile*, hitherto known only from Ecuador.

COLOMBIA: Comisaría del Putumayo, Páramo de Tambillo, nordeste del Valle de Sibundoy. "Flowers cream with red specks." December 13–14, 1942, *Richard Evans Schultes & C. Earle Smith 3094*.

MORACEAE

Perebea lecithogalacta (*R. E. Schultes*) *R. E. Schultes comb. nov.*

Castilla Ulei Warb. forma *lecithogalacta* R. E. Schultes in Bot. Mus. Leafl. Harvard Univ. 12 (1946) 128.

Further investigation has indicated that this concept, which was referred to *Castilla Ulei* as a form, represents a new species of the related genus *Perebea*.

The genus *Perebea* has hitherto not been considered as a commercial source of rubber, but *P. lecithogalacta* is felled indiscriminately with *Castilla Ulei* in the upper reaches of the Vaupés River in Colombia for the production of "caucho negro." The latex, when it flows from the wound, is first a deep cream color but rapidly becomes a bright canary yellow.

It is evident that the "caucho negro" of this area of

Colombia is a mixture of *Castilla* and *Perebea* latex, and it may well be that other genera furnish a part of this rubber so eagerly sought for during the recent war.

PROTEACEAE

Roupala colombiana *R. E. Schultes sp. nov.*

Arbor quindecim ad viginti quinque pedes alta, apparenter ramosa. Ramuli teretes, densissime et molliter rufo- vel cinereo-tomentosi. Folia alterna, elliptico-ovata, apice rotundato-subacuta (sed nunc subrotundata vel obscure acuta), basi late cuneata vel rotundata (*Killip & Smith 19737*), valde marginata, integra, vel saepe obscure sinuata (*K. & S. 19737*), valde coriacea, maturitate 7–10 cm. longa, 4.5–6.5 cm. lata (13 cm. longa, 10 cm. lata in *K. & S. 19737*), supra minute fusco-tomentella, nervorum centralium nervos secundarios versus dense sordide cinereo-tomentosa, venis plerumque elevatis et bene conspicuis, infra omnino densissime et molliter rufo-tomentosa (folia juniora multo rufiora), venis non valde elevatis; petioli dense tomentosi, 1–2.5 cm. longi. Racemi multiflori, axillares, quam folia multo longiores, aliquid rigidi, usque ad 15 cm. longi vel longiores, rhachide floribusque dense rufo-tomentosis. Bracteae minutissimae, caducae. Alabastri densissime rufo-tomentelli. Calycis lobi valde clavati, usque ad 11–12 mm. longi, contorti. Stylus longior, usque ad 12 mm. longus. Ovarium subcompresso-ovoideum, densissime et grossiuscule tomentosum, $2\times1.7\times1.5$ mm. Folliculus obliquus, elliptico-oblongus, valde compressus, apice attenuato-acutus, cinereo- vel fusco-tomentellus.

Vegetatively, *Roupala colombiana* resembles *R. saxicola*, but the reddish or rusty indumentum of the former is very much denser and softer than that of the latter. There is likewise a difference in the shape of the leaves. The flowers and the peculiarly strict, very long and

rather remotely flowered inflorescence exhibit further differences, and the fruits of the two species are entirely distinct, those of *Roupala saxicola* being fully rounded, apically obtuse, and glabrous, while those of *R. colombiana* are complanate, apically acute, and tomentulose.

COLOMBIA: Departamento Norte de Santander (Eastern Cordillera) between Mutiscua and Pamplona; alt. 2700 m. "Tree 15–25 ft., sepals cream white. Edge of woods." February 23, 1927, *E. P. Killip & Albert C. Smith 19762* (TYPE in Herb. Gray).—Same locality and date. *E. P. Killip & Albert C. Smith 19737*.—Departamento Norte de Santander, Cordillera oriental, vertiente oriental, Pamplona, Quebrada de Cariongo, matorrales, 2500 m. alt., 26 julio 1940, *J. Cuatrecasas & H. García-Barriga 10242*.

Roupala saxicola *R. E. Schultes sp. nov.*

Frutex usque ad duodecim vel quindecim pedes altus, ramosus. Rami teretes, nigro-cinereo cum cortice; ramuli densissime et molliter rufo-tomentosi. Folia pinnatipartita, 25–28 cm. longa, oppositi- vel suboppositi-foliola, cum 6–10 foliolis, petiolulata (petioli usque ad 5 mm. longi); foliola elliptico-oblonga, apice rotundata, basi cuneata, marginata, integerrima, coriacea, maturitate 7.5–11 cm. longa, 4.5–5.5 cm. lata, supra viridia, minute reticulata, minute tomentella nervorum centralium nervos secundarios versus dense rufo-tomentosa, venis vix elevatis, infra omnino densissime et molliter rufo-tomentosa, venis valde elevatis. Racemi densiflori, axillares, quam folia breviores, rigidissimi, usque ad 14 cm. longi, cum rhachide floribusque dense rufo-tomentosis. Bracteae minutissimae, caducae. Calycis lobi valde clavati, cucullati, 8–8.5 mm. longi, valde contorti et patentes. Stylus robustus, 9–10 mm. longus, paulo arcuatus; stigma capitato-clavatum. Ovarium sessile, grosse rufo-villosum, elongato-ovoideum. Folliculus (*Schultes 5457*) ovali-oblongus (noncompressus), glaber, rufo-aureus vel aureus, apice rotundatus, pedicello brevissimo, 3.2–3.5×2.2×2 cm.

Roupala saxicola differs from other species which have

a soft, dense, red indumentum by having perfectly entire, slightly marginate leaves. It is also striking in having a short and very dense inflorescence. The unusually broad and rounded leaflets of this species and also the fully rounded (not flattened) fruits are distinct in the genus.

COLOMBIA: Comisaría del Vaupés, Upper Apaporis Basin, Macaya River, Mount Chiribiquete. Sandstone. Xerophytic conditions. Savannah. Alt. 400–1200 ft. above forest floor or 1300–2100 ft. above sea-level. "Shrub up to 12 ft. Flowers greenish yellow. Growing on summit." January 18, 1944, *Richard Evans Schultes 5744*. (TYPE in Herb. Gray).—Same locality. "Small tree. Fruit yellow." May 15–16, 1943, *Richard Evans Schultes 5457*.

POLYGONACEAE

Triplaris Pavonii *Miessner* in DC. Prodr. 14 (1856) 172.

This widely distributed tree is one of the commonest species on floodable river-banks in the upper Apaporis River drainage-area.

COLOMBIA: Comisaría del Vaupés, confluence of Macaya and Ajaju Rivers, Puerto Hevea. Alt. about 300 m. "Bracts of calyx red. Tree." July 1943. *Richard Evans Schultes 5576*.

LEGUMINOSAE

Cynometra Zamorana *R. E. Schultes sp. nov.*

Arbor magna et robustissima, usque ad centum pedes alta. Truncus columnaris, duo pedes in diametro, brunneo cum cortice crasso. Foliola unijuga, obliqua, elliptica, apice breviter cuspidato-acuta, basi cuneata, saepe obscure marginata, coriacea, supra nitidissima, infra nitida, viridia, utrinque glabra maxima pro parte 13.5 cm. longa, 5–5.5 cm. lata; venae secundariae saepissime quindecim vel sedecim, supra non conspicuae sed infra valde elevatae, nervo centrali rufo; petioli crassiores. Racemi axillares, foliis saepius aequales, minutissime villosi pubi molli patenti, rhachide robusta, 6–7 cm. longa, pedi-

cellis crassis 8–10 mm. longis. Bracteae subtendentes caducissimae. Flores ignoti. Legumen subsessile, compressum, oblique ovoideum, minutissime cuspidatum, basi valde fusco-tomentosum, rufo-brunneum, conspicue rugosum, sublignosum vel lignoso-coriaceum, plerumque 3.7–4.3 cm. longum, 2.2–3 cm. latum, 1.8 cm. crassum. Semen transverse oblongum, arillatum, 2.5 cm. longum, 1.8 cm. latum, 1.2 cm. crassum, nigrum, nitidum. Arillus crassus, vivo siccus, pulverulentus, subluteus, gustatu dulcis.

Cynometra Zamorana is apparently not closely allied to any known species of this interesting genus. It is distinctive at once because of the large size of its leaves and its legumes. The Indians of the upper Vaupés River eat the dry, powdery, sweet, pulpy aril of the seed and use the trunks of the large tree in the construction of rafts. Among the Spanish-speaking inhabitants of the same region, *Cynometra Zamorana* is called *coca*, the same term which is widely used to refer to the completely unrelated narcotic plant *Erythroxylon Coca* Lam.

I have named this beautiful, majestic tree in memory of one of the boys who penetrated the upper Apaporis River with me on my first expedition to that uninhabited area. Armando Zamora, 19, a native of the town of San Martín, Intendencia del Meta, lost his life by drowning when he was swept through the lowermost rapids in the Macaya River on April 7, 1943, while performing his duties on that expedition.

COLOMBIA: Comisaría del Vaupés, Río Macaya, vicinity of Cachivera del Diablo. "*Coca.* Very tall tree (90 ft.) in swampland. Fruits reddish brown. Basal diameter 1½–2 ft. Bark reddish brown, rough. Fruit edible, sweet, reddish." May 14, 1943, *Richard Evans Schultes 5429* (TYPE in Herb. Gray).—Comisaría del Vaupés, Upper Apaporis Basin, region of confluence of ríos Macaya and Ajaju (Puerto Hevea). Forest. Alt. ca. 900 ft. "Tree 100 ft. tall. Bark brown, rough. Seed-pulp brown, edible, sweet. Fruit red-brown." May 1943, *Richard Evans Schultes 5424*.

TILIACEAE

Heliocarpus popayanensis *HBK.* Nov. Gen. et Sp. 5 (1821) 341.

A very common and rather widespread tree, *Heliocarpus popayanensis* has apparently not previously been reported from Amazonian Colombia.

COLOMBIA: Comisaría del Putumayo, Mocoa y los alrededores al norte. Alt. 750–850 m. "Small tree. *Balso blanco. Urtequillo blanco.*" Dec. 3–7, 1942, *Richard Evans Schultes 2077.*

BOMBACEAE

Bombax coriaceum *Martius & Zuccarini* Nov. Gen. et Sp. 1, 93 in obs.; K. Schumann in Martius Fl. Bras. 12, pt. 3 (1886) 219; emend. Dugand in Caldasia no. 10 (1944) 435.

This collection extends the known range of the diminutive *Bombax coriaceum* far to the east and indicates that probably the species will be collected in Venezuela. The type came from Araracuara on the Río Caquetá, where Martius found it in 1820 on the sandstone savannas which are so extensive there. More than one hundred and twenty years elapsed before it was rediscovered (*Schultes 5461* and *5616*) on the sandstone hills in the upper Apaporis basin—hills geologically and geographically the same as those at Araracuara two hundred kilometers distant—and on sandstone savannas at the headwaters of the Cuduyarí and Cubiyú (*Allen 3090*) about two hundred kilometers to the east of the Apaporis locality (Dugand in Caldasia no. 8 (1943) 298; no. 10 (1944) 435). The present collection (*Schultes & López 9342*) extends the known range another two hundred and fifty kilometers eastwards, and places *Bombax coriaceum* in the great Río Negro basin. This still further strengthens our belief (based upon the study of the distribution of a number of plants of eastern Colombia and southern

Venezuela) in the close geological and floristic relationship or even the identity of the now discontinuous sandstone remnant hills and savannas which, crossing the Colombian Amazon drainage-area in an arc from southern Venezuela westward and southwestward, appear to be an ancient outlier of the formidable Venezuelan-Guianan land-mass.

COLOMBIA: Comisaría del Vaupés, Río Negro, San Felipe (opposite San Carlos, Venezuela). Caatinga. "Low shrub 3 ft. tall. Leaves very coriaceous." December 12, 1947, *Richard Evans Schultes & Francisco López 9342*.

FLACOURTIACEAE

Mayna longifolia *Poeppig & Endlicher* Nov. Gen. ac Sp. 3 (1845) 64, t. 271.

Although *Mayna longifolia* is not uncommon in Amazonian Peru and Brazil, it does not seem to have been reported from eastern Colombia. A variety (var. *phasmatocarpa*) has been described from the upper reaches of the Vaupés River (Schultes in Bot. Mus. Leafl. Harvard Univ. 12 (1946) 125).

COLOMBIA: Comisaría del Amazonas, Trapecio amazónico, Loretoyacu River, alt. about 100 m. "Small tree. Fruit white." September–November 1944, *Richard Evans Schultes 6381*.

BEGONIACEAE

Begonia lutea *Smith & Schubert* in Caldasia 4 (1946) 11.

Begonia lutea is a widespread, though rare, species in eastern Colombia, as indicated by the four collections which have been made of this species. *Schultes & López 10062* represents the easternmost limit of its known range. The type or westernmost collection (*Pennell 1537*) was made near Villavicencio in the foothills of the Andes. *Cuatrecasas 7547*, from the Río Guayabero in the Vaupés, and *Schultes 5658*, from the upper Apaporis

basin, are intermediate and show that this species is probably an ancient remnant now represented discontinuously in eastern Colombia.

COLOMBIA: Comisaría del Vaupés, Río Guainía, Río Naquiení, Cerro Monachí. "On shady, rocky cliff. Flowers yellow." June, 1948. *Richard Evans Schultes & Francisco López 10062.*

LYTHRACEAE

Cuphea cathargenensis (*Jacq.*) *Macbride* in Field Mus. Publ. Bot. 8 (1930) 124.

Cuphea cathargenensis has been collected in nearly all parts of Colombia but has hitherto apparently not been recorded from the Amazon watershed.

COLOMBIA: Comisaría del Putumayo, Valle de Sibundoy, alt. ca. 2250 m. "Flowers violet." Feb. 12, 1942, *Richard Evans Schultes 3201.*

Cuphea racemosa (*L.f.*) *Sprengel* Syst. 2 (1825) 455.

This species has been collected very frequently along the entire Andean cordillera of Colombia in Antioquia, Caldas, El Valle, Cauca, and possibly in Nariño. *Schultes & Smith 2097* seems to be the first collection from the Amazon watershed. The plant is used, in the form of a decoction, as a diuretic by the Inga Indians of Mocoa.

COLOMBIA: Comisaría del Putumayo, Mocoa. Alt. 750–850 m. "Diuretic. Flowers purple. Inga name: *i-spa-na-nai-ambe.* Dec. 3–7, 1942, *Richard Evans Schultes & C. Earle Smith 2097.*

Cuphea strigulosa *HBK.* Nov. Gen. et Sp. 6 (1823) 204.

Cuphea strigulosa is frequent in the Andes of Peru, Ecuador and Colombia. The collection cited below is the first from Huila and the southernmost from Colombia.

COLOMBIA: Departamento del Huila, Pitalito, Quinche, open fields. Alt. 1300 m. December 30, 1942, *Richard Evans Schultes & M. Villarreal 5119.*

Graffenrieda fantastica *R. E. Schultes & L. B. Smith sp. nov.*

Frutex usque ad duodecim pedes altus. Truncus valde contortus, nigro cum cortice 1–1.5 cm. crasso. Rami teretes, crassissimi et molles, vivo rufo-brunneo cum cortice chartaceo, nitidissimo, decorticanti, siccitate cinereo-nigro. Folia rotundato-ovata, basi subcordata, apice subrotundata vel obscure subacuta, marginata, quinquenervia, nervis transversalibus utrinque obscuris, siccitate atrofusca vel luteo-viridia, vivo atroviridia, omnino glabra et nitidissima, 8–10 cm. longa, 6–8 cm. lata, longe petiolata; petioli teretes, 3 cm. longi, dure et crasse coriacea. Paniculae terminales, multiflorae, quam folia multo longiores. Flores albi, usque ad 5 mm. lati. Calycis tubus suboblongus, 1–1.5 mm. altus, basi rotundatus, apice paulo dilatatus, omnino glaber, fusco-purpureus, profunde trilobatus, lobis triangularibus, apice rotundatis, Antherae flavae, subulatae, falcato-recurvatae, 2–3 mm. longae, 0.5 mm. crassae, loculis arcuato-crispatis apice longe attenuatis, connectivo in parte basali breviter calcarato. Petala ovata, margine paulo irregularia, erecto-patula, membranacea, alba, 3–4.5 mm. longa, 2–2.5 mm. lata. Ovarium conspicue quinquesulcatum, superne rotundatum, 1.5–2 mm. longum. Stylus luteus, gracilis, 6–7 mm. longus, stigmate capitellato. Capsula fuscentia, ovoidea, apice valde truncata, 3.5–4 mm. longa, 2.5–3 mm. in diametro.

This extraordinary bush, growing in the most exposed and inhospitable places on Mount Chiribiquete, is certainly one of the most outstandingly distinct species of the genus. It does not appear to be closely related to any known species, perhaps approaching most closely *Graffenrieda sessilifolia* Triana, which is found on Mount

Roraima in southern Venezuela. Both are highly adapted to xerophytic conditions, having thick, coriaceous leaves. *Graffenrieda fantastica* is further adapted to xerophytic conditions by having the young and crassulent branchlets tightly covered with a chartaceous and apparently impervious bark which, when broken, easily peels from the stem.

Graffenrieda fantastica is one of the dominant shrubs on the long, flat sterile sandstone summit of Mount Chiribiquete where it forms dense stands of at least one thousand per hektar, intermingled with ***Hevea nitida*** var. ***toxicodendroides Ficus chiribiquetensis, Plumeria*** sp., ***Bombax coriaceum, Roupala saxicola, Gongylolepis maroana*** and ***Senefeldera chiribiquetensis.*** The collection ***Schultes 5620*** was formerly identified and reported (in Caldasia 3 (1944) 121–130; in Chron. Bot. 9 (1945) 123–127), as representing ***Miconia paradoxa*** Triana, a vegetatively very similar xerophyte from the nearby sandstone hills of Araracuara.

COLOMBIA: Comisaría del Vaupés, Upper Apaporis Basin, Río Macaya, Cerro Chiribiquete, alt. about 1200 ft. above forest floor or 2100 ft. above sea-level. "On sterile sandstone top of mountain. Leaves fleshy. Flowers white, very fragrant. Bush up to 12 ft., very scraggly. Bark basally rugose, grey; terminally glossy, red-brown." July 24, 1943, *Richard Evans Schultes 5620* (TYPE in Herb. Gray; DUPLICATE TYPES in U.S. Nat. Herb., Herb. Nac. Colomb.).—Same locality. "Scraggly bush, 8–10 ft. tall." May 15–16, 1943, *Richard Evans Schultes 5467*.

GENTIANACEAE

Chelonanthus chelonoides (*L.f.*) *Gilg* in Engler et Prantl. Pflanzenfam. 4, Abt. 2 (1895) 98.

This heliophile is sometimes found in extraordinary abundance on the open savannas of the sandstone mountains of the upper Apaporis basin.

COLOMBIA: Comisaría del Vaupés, Macaya-Ajaju River confluence, Mount Chiribiquete. "Flowers greenish yellow. Plant 5 ft. tall, becoming bushy." May 15–16, 1943, *Richard Evans Schultes 5441*.

APOCYNACEAE

Ambelania Markgrafiana *Monachino* in Lloydia 8 (1945) 122.

The three known collections of *Ambelania Markgrafiana* from Colombia indicate that the species is rather widely distributed, though rare, in the Colombian Amazonia. It is also known from the western Amazonas of Brazil.

Ambelania Markgrafiana is of no commercial importance. Its latex does not have the qualities which might make it of value as a chicle. It is, however, often used to adulterate the latex of *Couma macrocarpa* Barb. Rodr. which is employed in the manufacture of chewing gum. According to elderly members of the Witoto tribe who recall the days of the infamous Putumayo atrocities of the Casa Arana, the latex of both *Ambelania Markgrafiana* and *Couma macrocarpa* was added to that of *Hevea* in an attempt to satisfy over-exigent rubber exploiters.

At the present time, the Witotos of the Karaparaná and Igaraparaná Rivers paint their legs and arms with a coating of *Ambelania* latex as a protection from the millions of gnats or "jejenes" which, at certain seasons, abound in many localities of the Amazonas.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Pucarón, alt. 240 m. "Arbol de 10 m. que crece grueso, con mucho látex blanco: corola amarilla, lóbulos parduzcos; frutos grandes, comestibles, aromáticos." October 2, 1939, *J. Cuatrecasas 7129*.—Intendencia del Amazonas, path between El Encanto and La Chorrera. "Tall tree, 20 m. Basal diameter 1 ft. Bark black. Very abundant latex, white. Fruit edible, sweet, yellow-green. Witoto name: *do-ko-gay*." May 31–June 2, 1942, *Richard Evans Schultes 3877*.—Comisaría del Vaupés, Upper Apaporis basin, between ríos Itilla and Macaya, near Corinto. "Slender tree 50 ft. tall. Very abundant, thick, white latex. Bark thin,

smooth with black and grey patches. Basal diameter 1–1½ ft. Nom. vulg. *palo de leche.*" April 1–7, 1943, *Richard Evans Schultes 5357.*

Rubiaceae

Cephaelis barcellana (*Muell.-Arg.*) *Standley* in Field Mus. Publ. Bot. 8 (1930) 184.

Known from Amazonian Brazil and from the Territorio del Amazonas of Venezuela, *Cephaelis barcellana,* although enumerated by Standley in "The Rubiaceae of Colombia," apparently had not hitherto been collected in the Republic. The collection, *H. Antonio Camilo 85,* from Florencia, Comisaría del Caquetá, is also probably referable to *Cephaelis barcellana* and would widen the known range of this species in Colombia.

Colombia: Comisaría del Putumayo, Río Putumayo, trocha entre Puerto Ospina y Concepción, alt. 250 m. "Flowers white. Bracts red and yellow." April 20–23, 1943, *Richard Evans Schultes 3678.*

Duroia hirsuta (*Poepp. & Endl.*) *K. Schumann* in Pringsh. Jahrb. Wiss. Bot. 19 (1888) 361.

The type of *Duroia hirsuta* was collected in Villavicencio. Although known from Amazonian Brazil, this species has apparently never been recorded from the Amazon drainage-area of Colombia.

This small tree occurs in dense forests, but I have never seen it growing individually. It forms colonies of twenty or more and invariably nothing grows underneath except *Selaginella.* Known widely in Amazonian Colombia as *solimán, Duroia hirsuta* is believed by the Indians to be a plant whose roots "poison" all other plants. Thus they explain the curious ecological phenomenon of the absence of other plants in colonies of *Duroia hirsuta.* The real reason may have some connection with the fact that the swollen internodes of the treelet are inhabited in all cases by ants.

Colombia: Comisaría del Vaupés, Apaporis River, near confluence

of Ajaju and Macaya. "*Solimán.*" January 1944, *Gabriel Gutiérrez & Richard Evans Schultes 612.*

Compositae

Gongylolepis maroana *Badillo* in Bot. Soc. Venez. Cienc. Nat. 8 (1943) 237.

The collections cited below are extremely significant because they place the genus *Gongylolepis* for the first time far within Colombian territory and very greatly extend to the southwest the known range of this species.

Gongylolepis maroana was described from material collected by Llewelyn Williams at the town of Maroa on the Venezuelan side of the lower course of the Río Guainía. Therefore, coming from so near Colombian territory, this species was to be expected in Colombia, but Mount Chiribiquete is fully 500 kilometers to the southwest. *Allen 3167* and *Schultes 5740A* are very good matches for the type, the only other collection of this species.

Gongylolepis is a small genus associated with the ancient flora of the Guianan-Venezuelan land mass. The first species described was *Gongylolepis Benthamiana* Rob. Schomb. from the Mazurini River drainage-area in British Guiana. Recently, Blake described *Gongylolepis glaberrima* and *G. erioclada* from Mt. Duida. The fourth species, *Gongylolepis maroana*, is the westernmost representative of the genus. The two collections cited below emphasize the strong relationship between the mountains of the upper Apaporis and the Vaupés and the Duida-Roraima mass.

Colombia: Comisaría del Vaupés, Río Vaupés, Yuruparí Falls. "Small tree—3 m., flowers deep, dull purple." November 10, 1943, *Paul H. Allen 3167.*—Comisaría del Vaupés, upper Apaporis basin. Macaya River, Mount Chiribiquete. Sandstone. Xerophytic conditions. Savanna. Alt. 400–1200 ft. above forest floor, 1350–2150 ft. above sea-level. "Low spreading shrub, with thick, coriaceous leaves. Very abundant." January 18, 1944, *Richard Evans Schultes 5740A.*

EXPLANATION OF THE ILLUSTRATIONS

PLATE XXXII. ROUPALA COLOMBIANA *R.E.Schultes.* A. Flowering branch, one half natural size. B. Buds, about two and one half times natural size. C. Flower, about three and one half times natural size. D. Fruit, one half natural size.

Drawn by ELMER W. SMITH

PLATE XXXIII. ROUPALA SAXICOLA *R. E. Schultes.* A. Flowering branch, one half natural size. B. Buds, about twice natural size. C. Flower, about four times natural size. D. Fruit, one half natural size.

Drawn by ELMER W. SMITH

PLATE XXXIV. CYNOMETRA ZAMORANA *R.E.Schultes* Fruiting branch, one half natural size.

Drawn by ELMER W. SMITH

PLATE XXXV. GRAFFENRIEDA FANTASTICA *R. E. Schultes & L.B.Smith.* A. Flowering branch, about one half natural size. B. Fruiting inflorescence, about one half natural size. C. Bud, about four and one half times natural size. D. Flower, about four and one half times natural size. E. Bark of older basal portion of trunk.

Drawn by ELMER W. SMITH

EXPLANATION OF THE ILLUSTRATIONS

PLATE XXXVI. (Upper figure). BEGONIA LUTEA *Smith & Schubert.* Habit photograph of the colony from which the collection *Schultes & López 10062* was made.

Photograph by R. E. SCHULTES

(Lower figure). GRAFFENRIEDA FANTASTICA *R. E. Schultes & L. B. Smith.* Photograph of the tree from which the type collection was made.

Photograph by R. E. SCHULTES

PLATE XXXVII. AMBELANIA MARKGRAFIANA *Monachino.* Flowering and fruiting branch of the plant from which *Cuatrecasas 7129* was collected.

Photograph by J. CUATRECASAS

Plate XXXII

ROUPALA *colombiana* R. E. Schultes



Plate XXXIII

ROUPALA
saxicola
R. E. Schultes

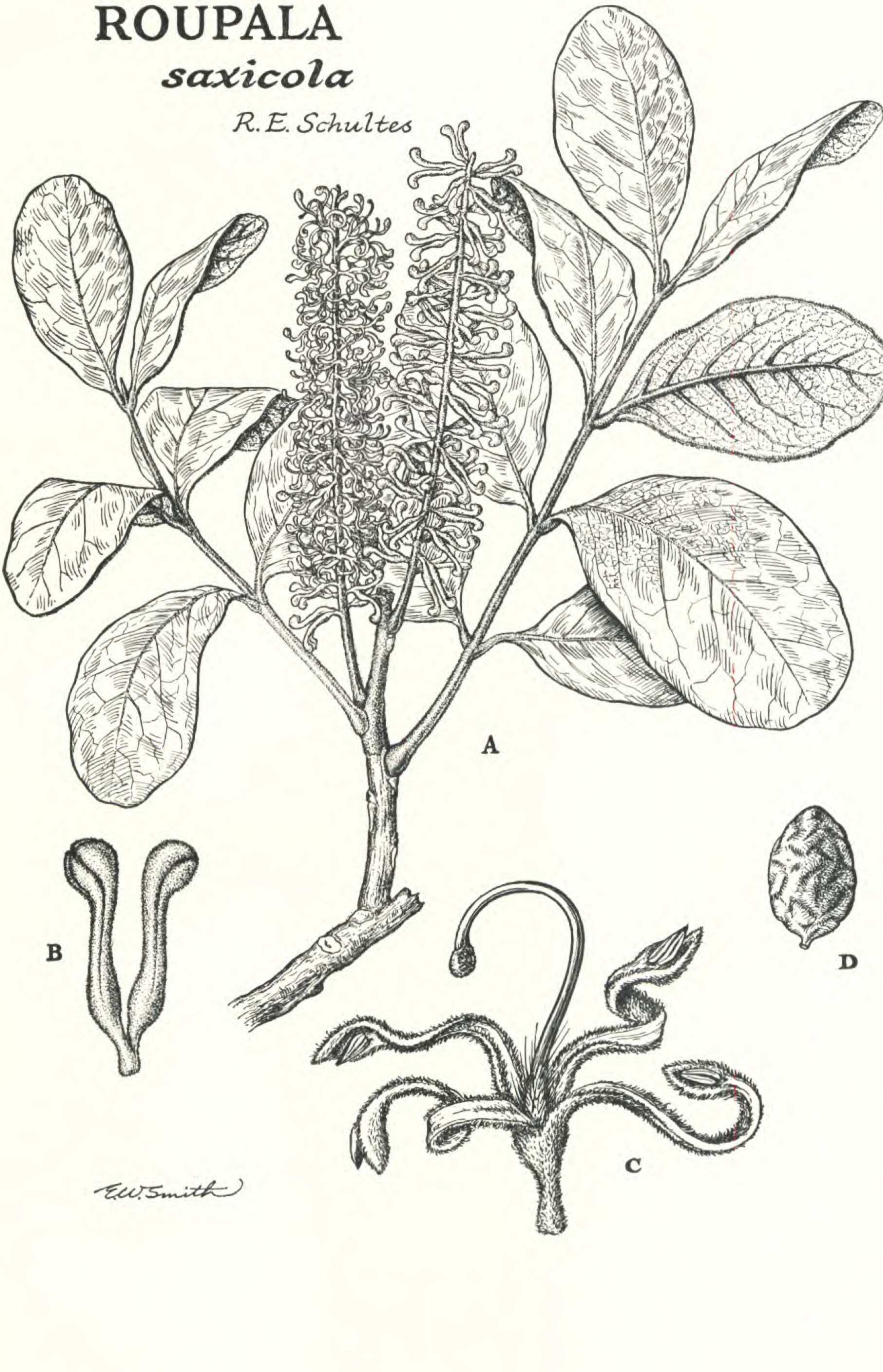


PLATE XXXIV



CYNOMETRA

Zamorana

R. E. Schultes

PLATE XXXV

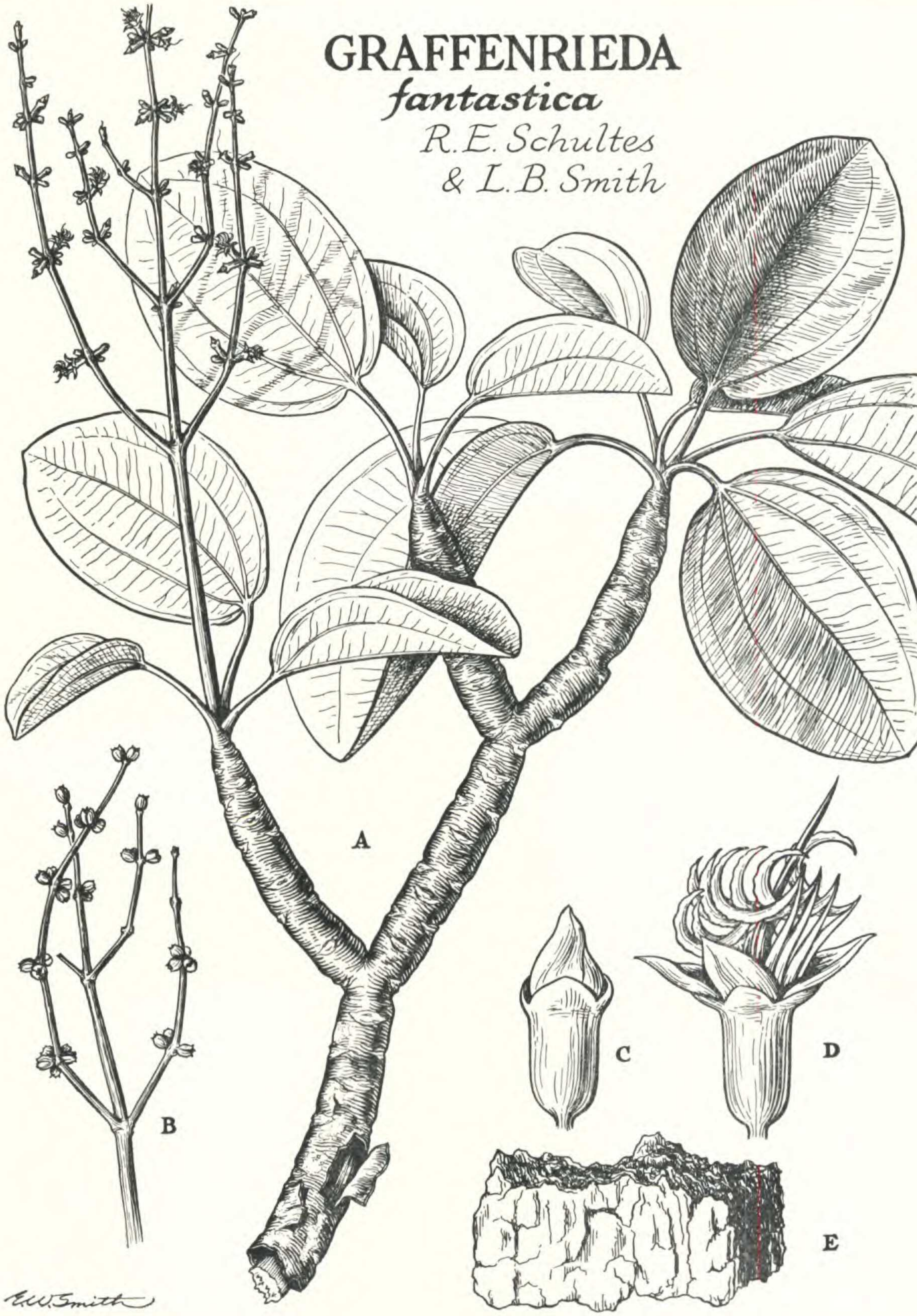

GRAFFENRIEDA
fantastica
R.E. Schultes
& L.B. Smith
A
B
C
D
E
E.W. Smith

Plate XXXVI



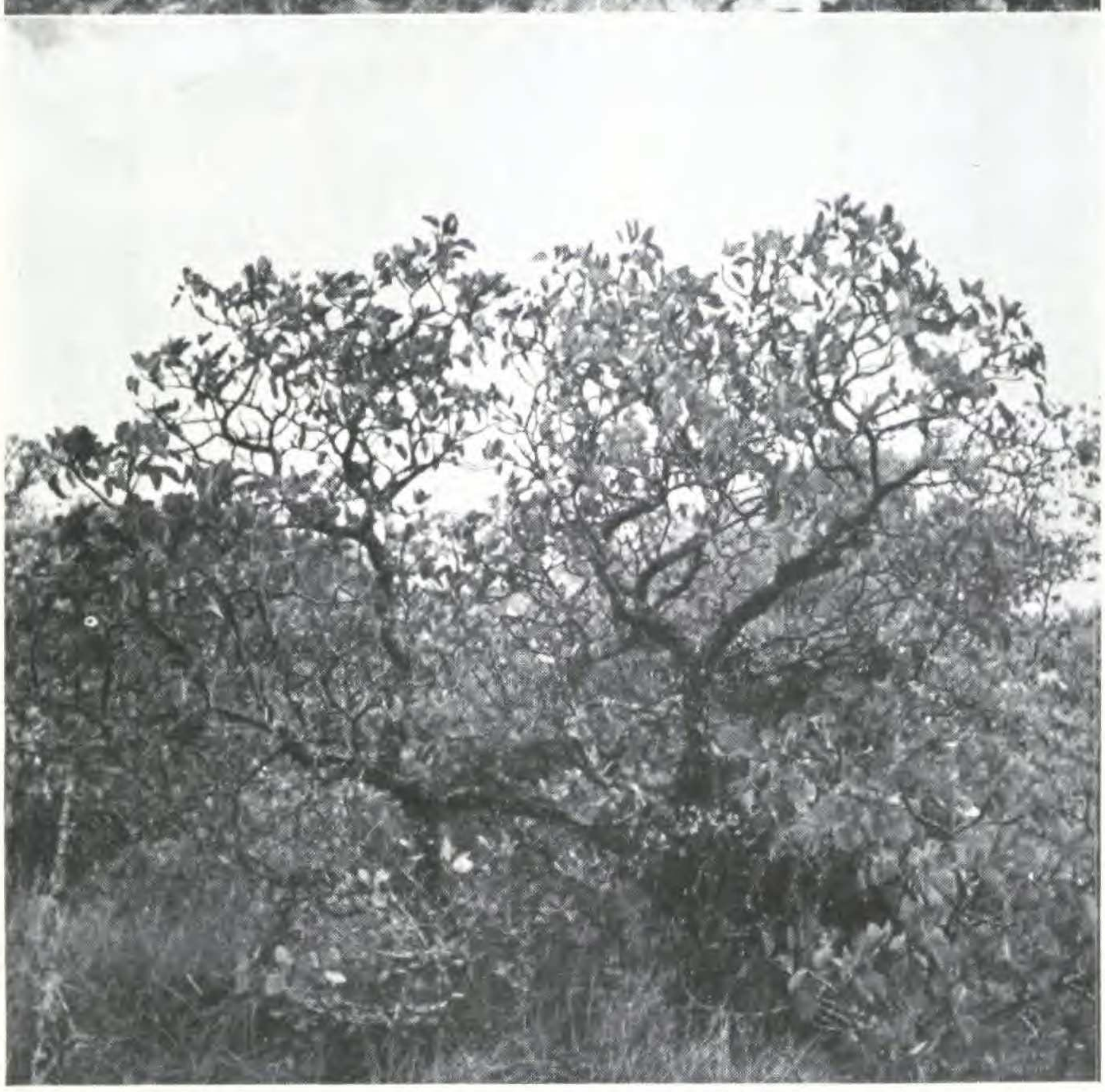


Plate XXXVII

